

JMPS Technical Overview

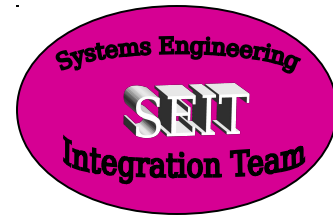


**Mission Planning SEIC
Industry Day**

16 Dec 02



JMPS Goals



→ *Mission Planning Fly, Fight,*

Mission Statement

- Evolve world-class joint mission planning capabilities to support the war-fighter today and support Joint Vision 2010

Objectives

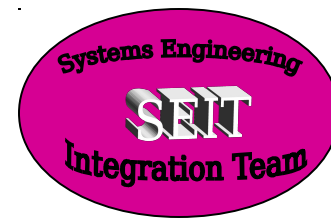
- Scaleable framework for MP systems (AF, Navy, SOF, Army)
- Collaborative interservice mission planner
- COE Compliance
- Reduce life-cycle costs
- Capability \geq legacy systems
- Smooth migration



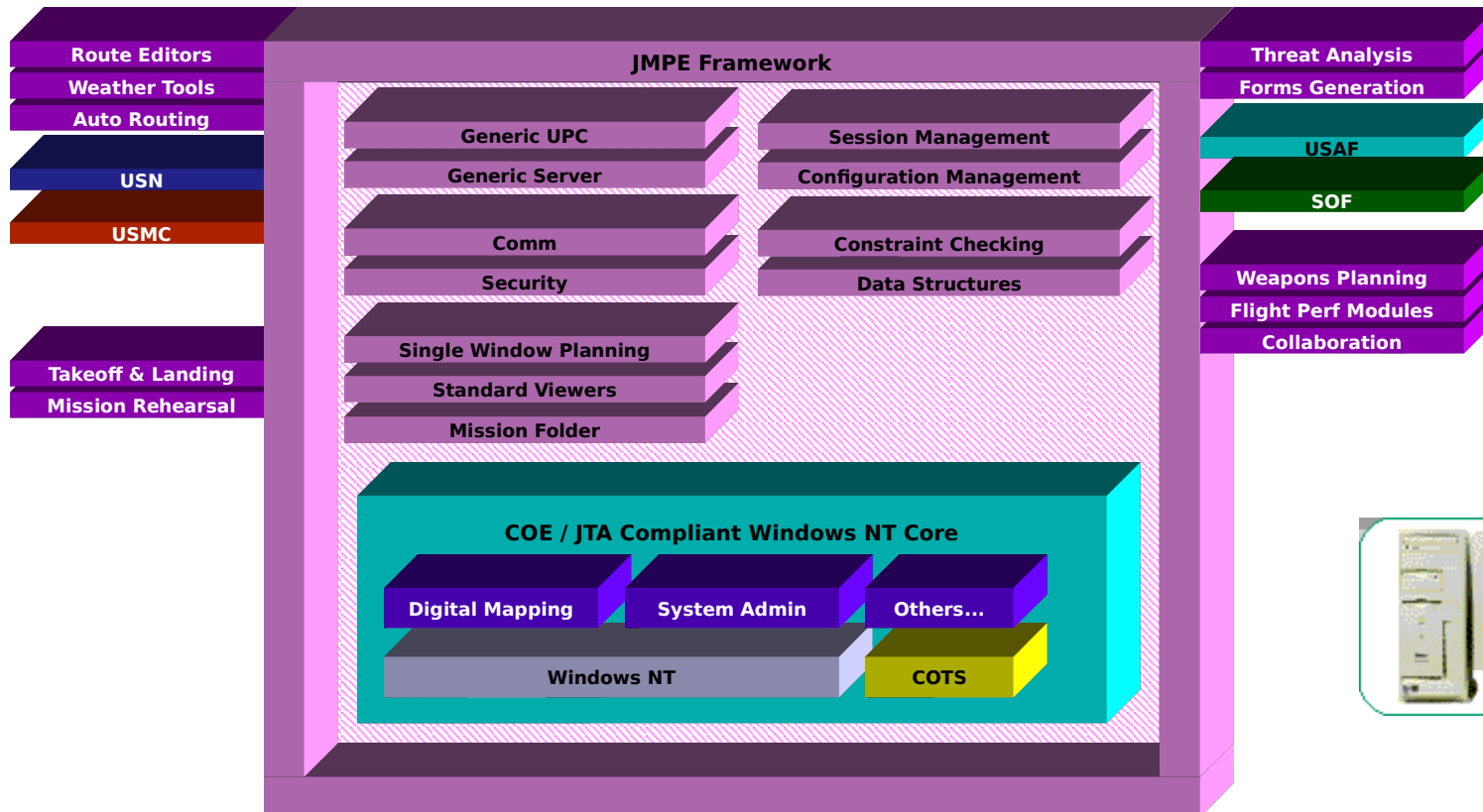
JMPS Vision

JMPE + Service

Unique+Hardware

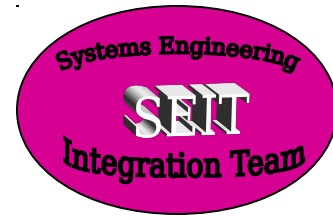


Mission Planning Fly, Fight,





Architectural Goals

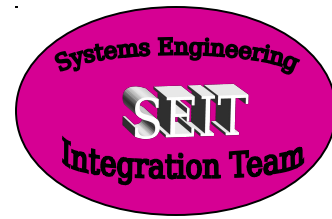


Mission Planning Fly, Fight,

- Meet planner expectations for functionality and ease of use
 - The benefit is better plans in less time
- Empower developers to implement unique requirements
 - The benefit is enhanced functionality at an affordable price
- Support asynchronous component integration
 - The benefit is fewer schedule dependencies leading to a shorter, more productive integration and fielding effort
- Interact through a Windows/PFPS-like interface
 - The benefit is intuitive behavior and systems that are readily scaled and configured to the planning environment, reducing training time
- Access planning data across the network or on a laptop seamlessly
 - The benefit is rapid, user friendly information access
- Enable collaborative problem solving
 - The benefit is rapid and effective plan development



Ease of Use



Mission Planning Fly, Fight,

Lesson Learned - Although
planning system may provide
world-class functionality, if it
is difficult to use it will be judged
a failure by its users

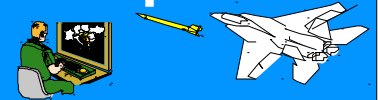


Architectural Features

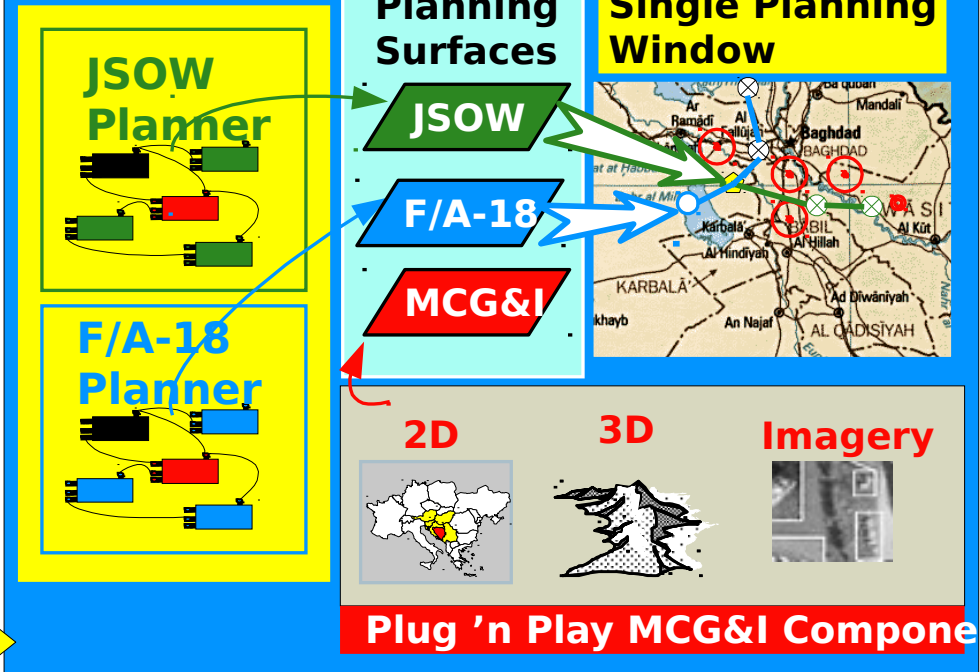
- ✓ Intuitive Environment - leverage MS Office & PFPs
- ✓ Automated Briefings - reduce planning time
- ✓ Mission/Strike Binders - user oriented view of plan
- ✓ Drag N' Drop Planning - intuitive paradigm
- ✓ Virtual Planning Surface
- ✓ Single Window Planning

Integrated Platform & Weapon Plan

- ✓ Single Planner
- ✓ Collaborative Planners

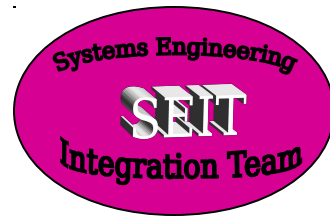


A Composite View is Presented in a Single Planning Window





Coordinated Planning

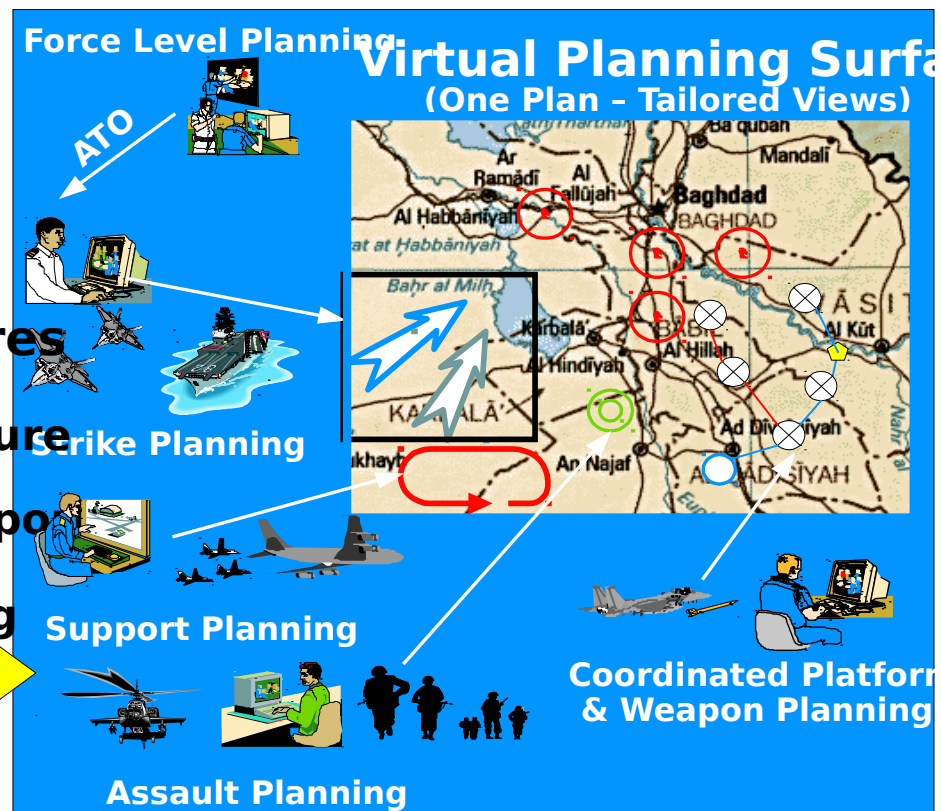


Mission Planning Fly, Fight,

Lesson Learned - Planning effectiveness can be significantly enhanced through coordination regarding related missions and between force level and unit planners

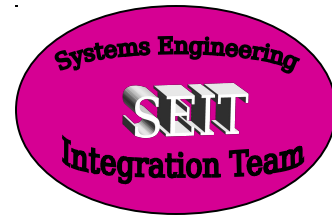
Architectural Features

- ✓ NT MSMQ - provides collaboration infrastructure
- ✓ Framework - supports legacy system import/export
- ✓ COM/CORBA Bridges - connect to force planning
- ✓ Virtual Planning Surface provides a powerful tool
- ✓ MLS - will significantly enhance collaboration



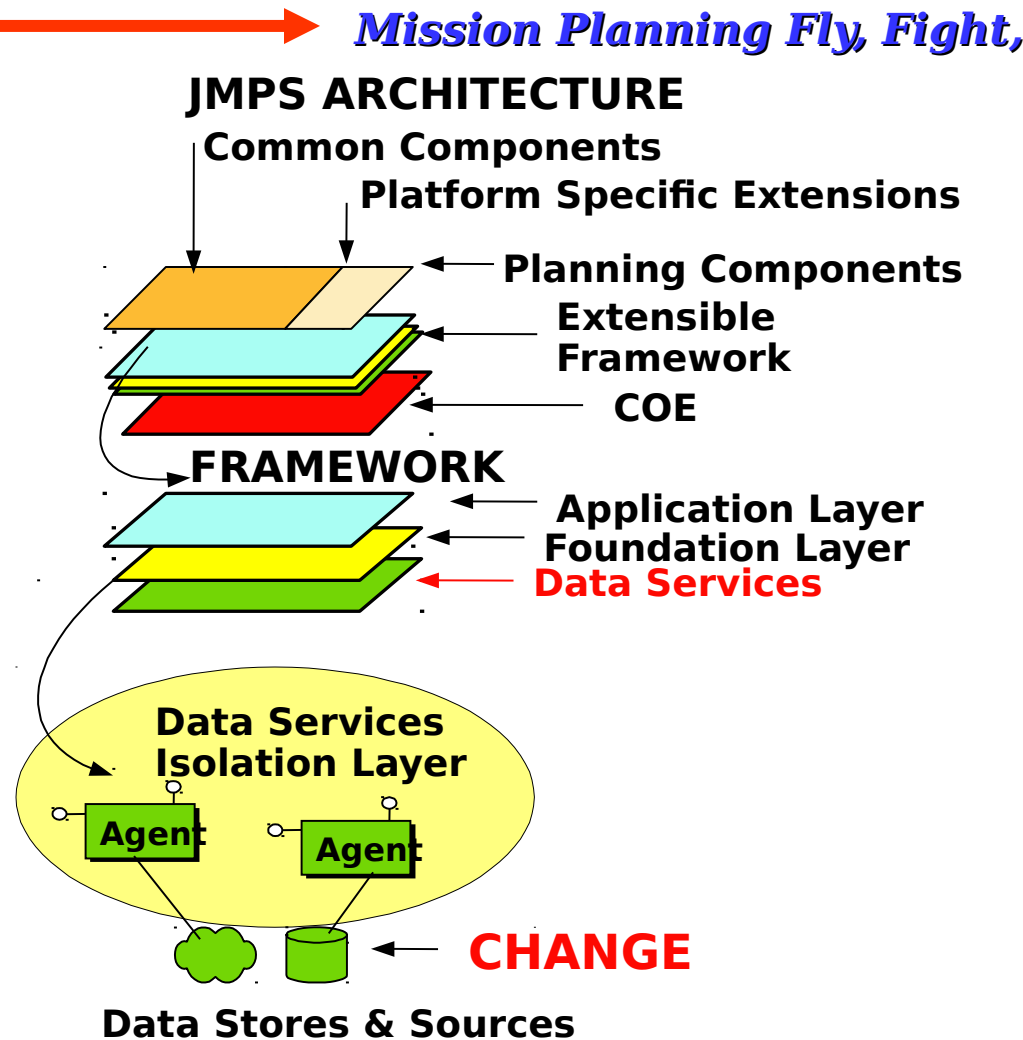


Layered Architecture



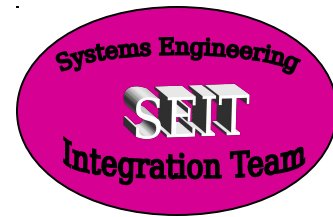
- Architecture separates business logic from data sources

- Framework Data Services provides isolation layer
- Data access agents localize impact of change
- Concept supports multiple data sources for same data type (e.g., weather data)

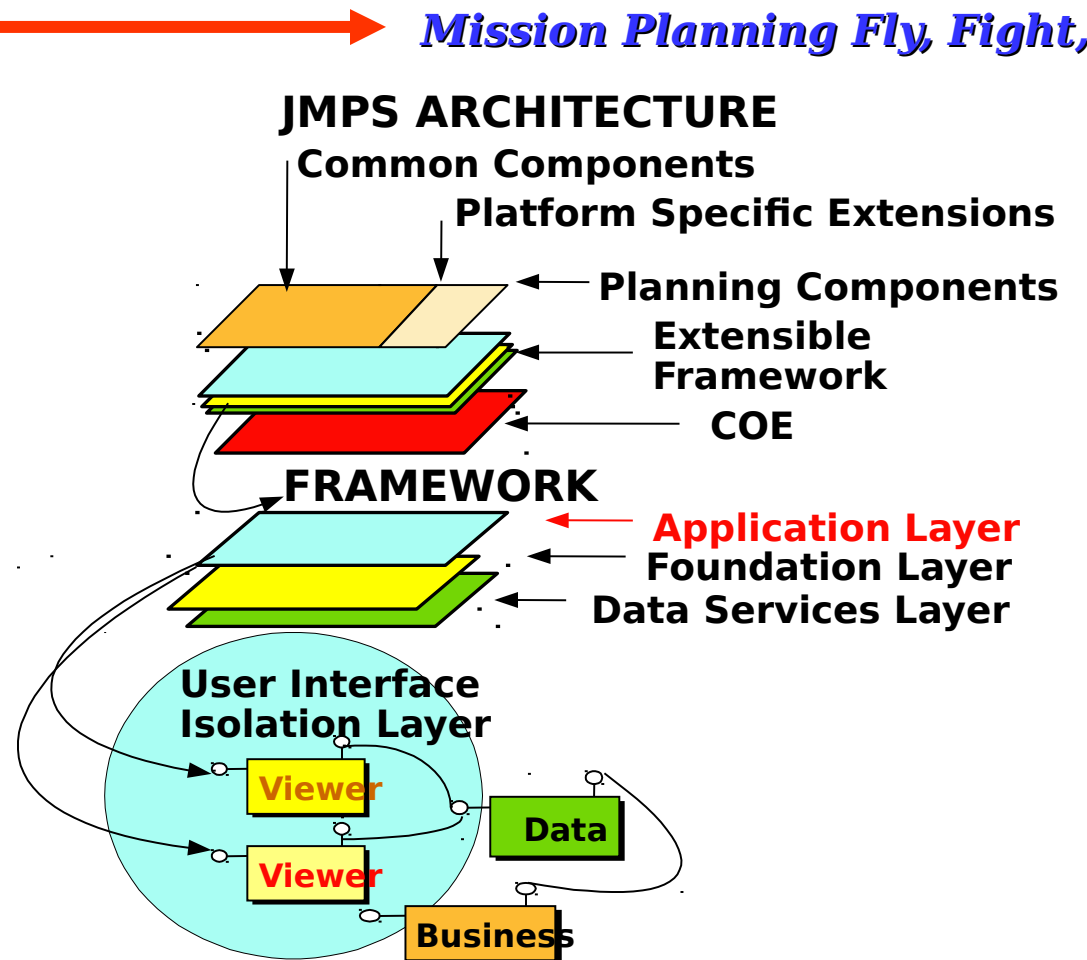




Layered Architecture

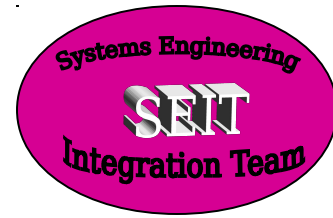


- Architecture separates USI from business logic and data
 - Framework provides viewers and view container
 - Supports use of viewers scaled to user planning problem and hardware platform
 - Supports multiple views of the same data object (collaboration)
 - Allows independent evolution of USI (e.g., multimedia)





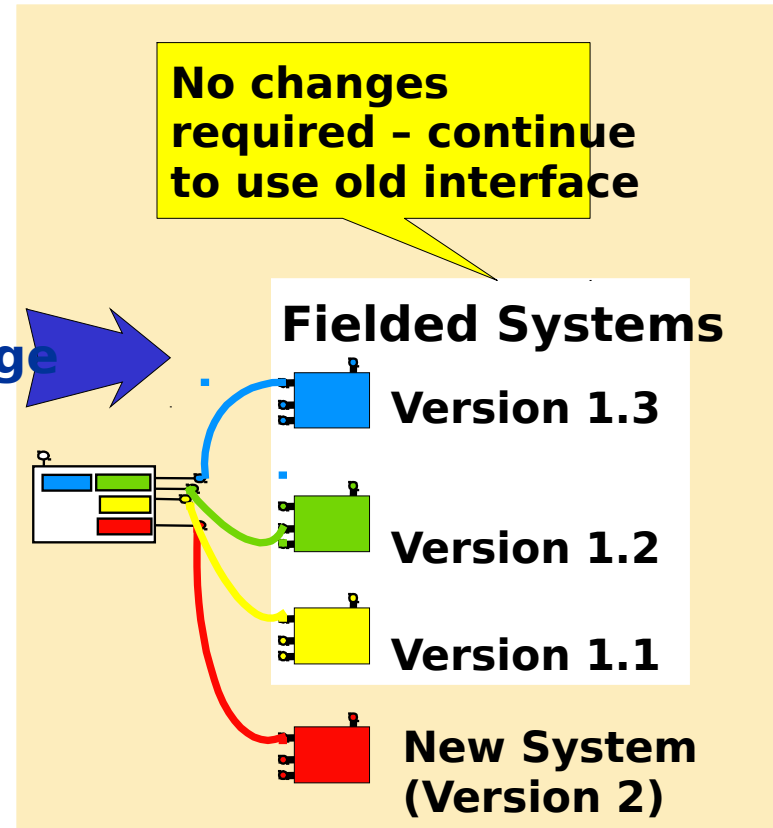
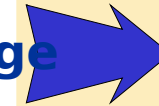
COM Versioning



Mission Planning Fly, Fight,

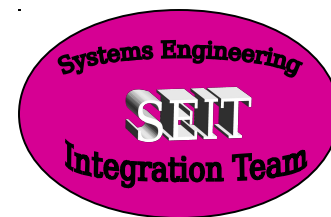
- **Old interfaces maintained**
 - Minimizes impact to fielded systems
 - Supports asynchronous fielding
- **COM is a binary standard**
 - Language independent
 - Supports evolution
- **Components bind at run time**
 - Run-time configuration build
 - Reduces fielding costs

Minimize Change

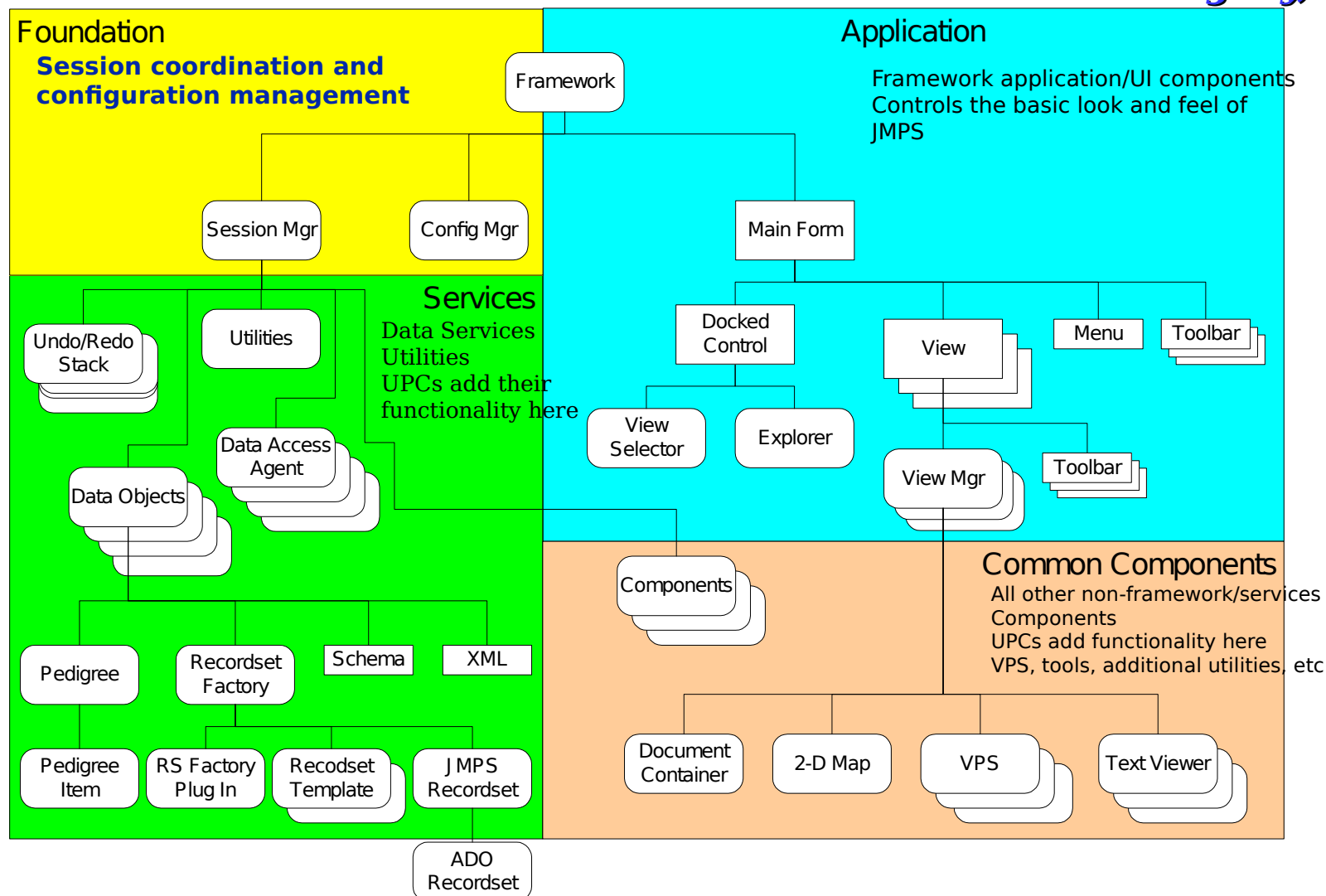




High level component relationships

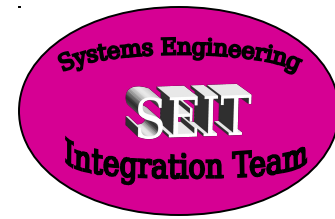


Mission Planning Fly, Fight,



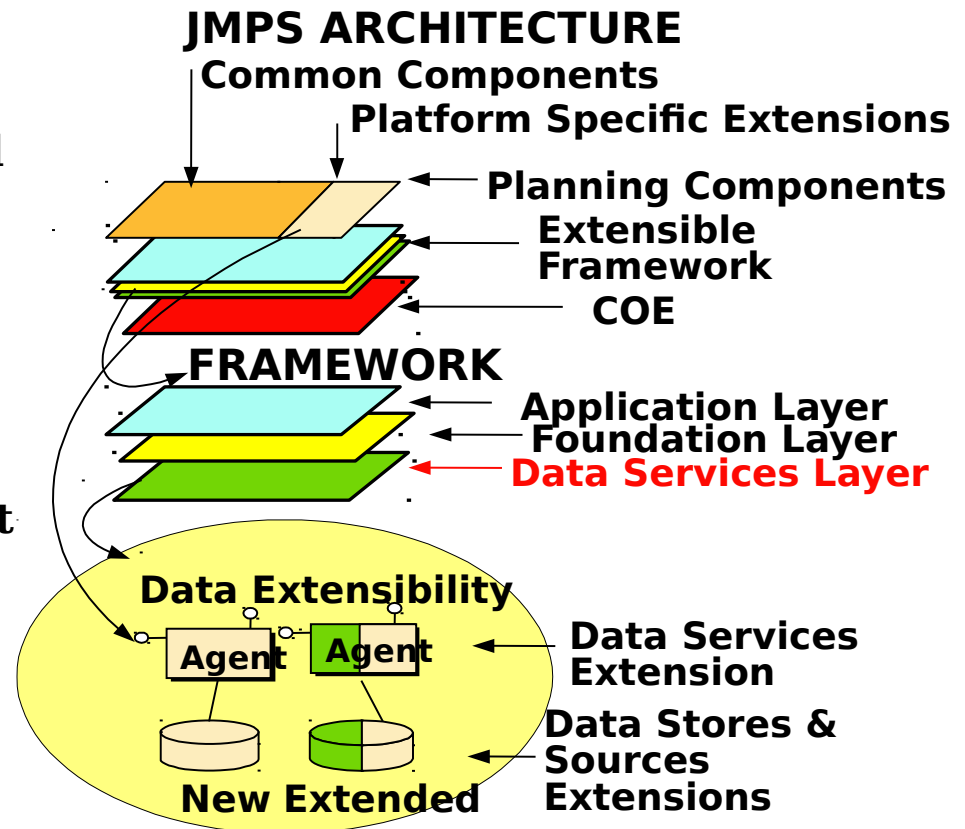


Data Structure Extensibility



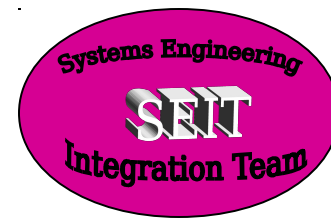
Mission Planning Fly, Fight,

- For platform unique data:
 - Developers can extend existing databases or add new ones
 - Developers can access extended or new databases by either extending an existing component or by adding their own new component
 - Extensions can be accomplished without coordination with the framework or other UPC developers

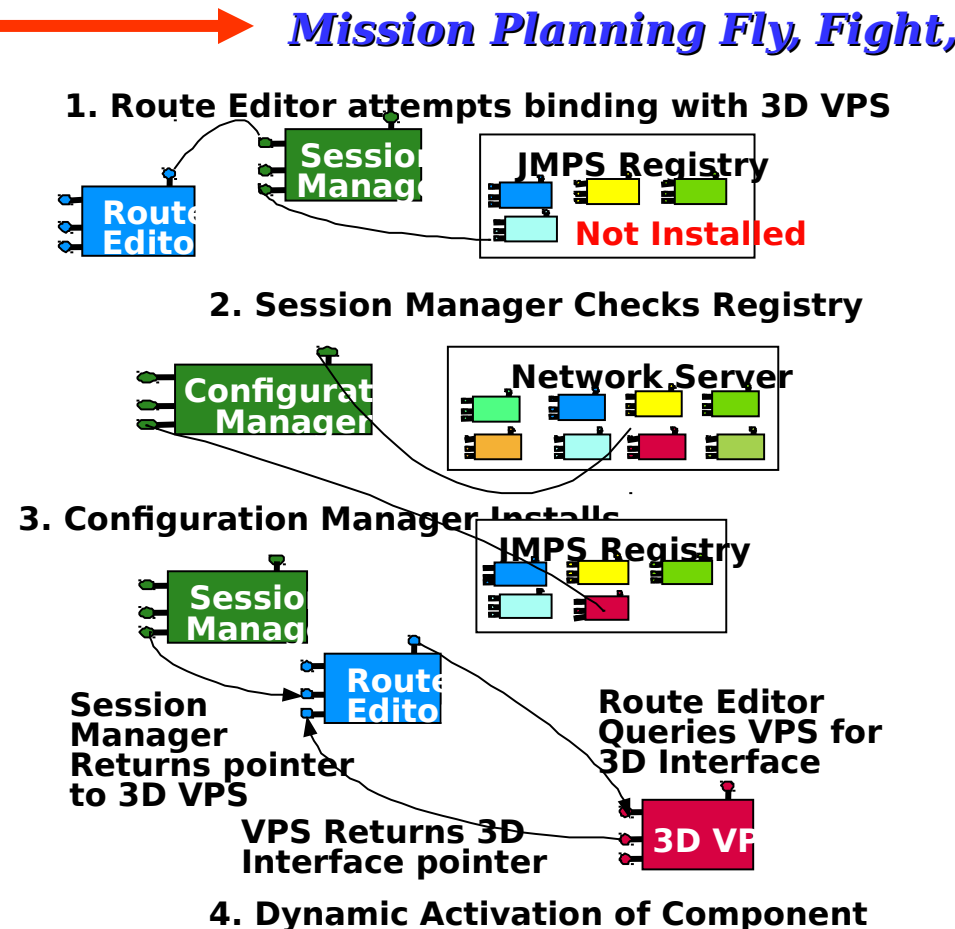




Dynamic Component Discovery

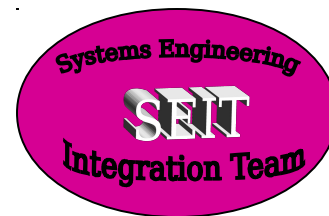


- COM architecture supports dynamic run-time discovery of components
- This allows updated components to be introduced without modification of fielded systems
- New/updated components can be added to a configuration at run time
 - Configuration manager will install from LAN server if component must run locally (e.g., a VPS)
 - Configuration manager maintains rules on what components must be local and what configurations are certified for use

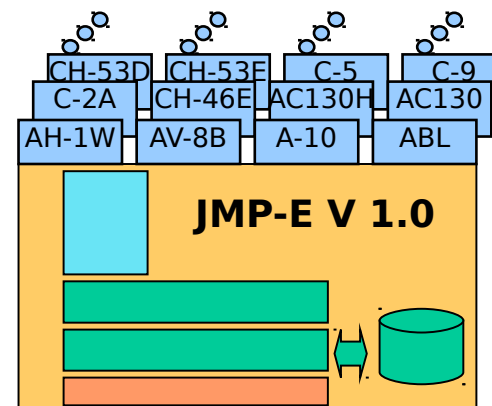
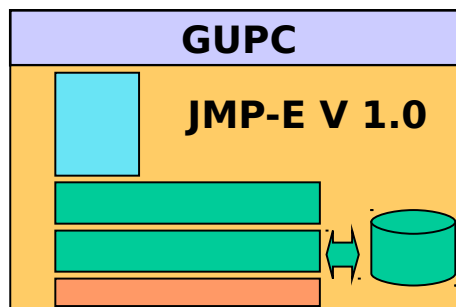
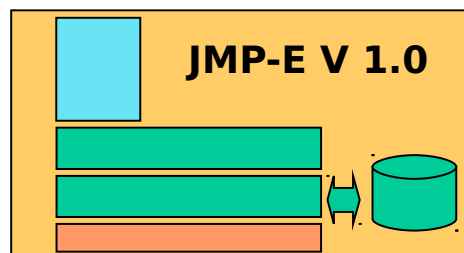
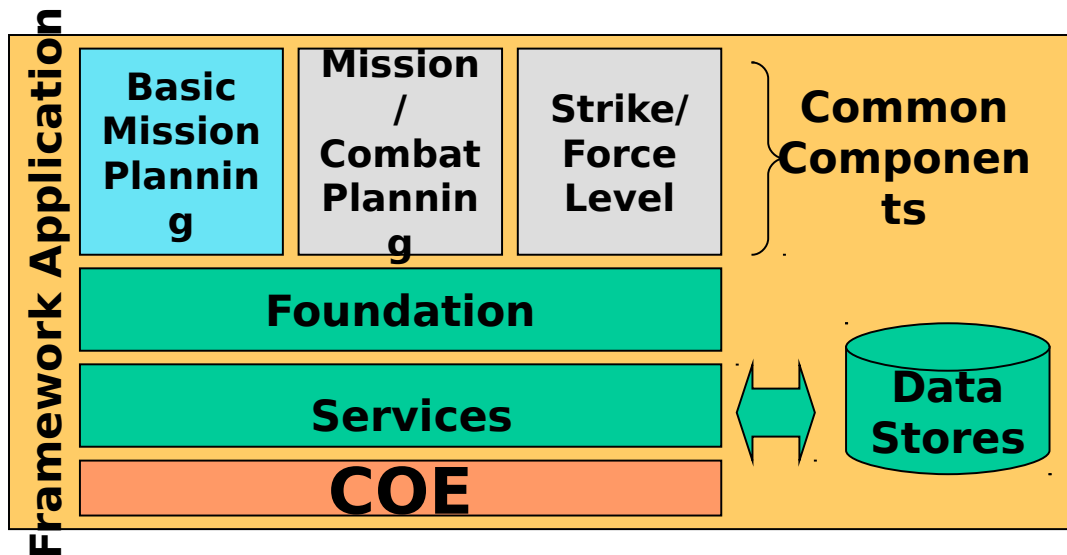




Component Architecture Overview

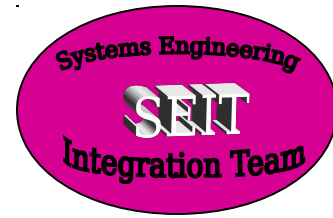


Mission Planning Fly, Fight,

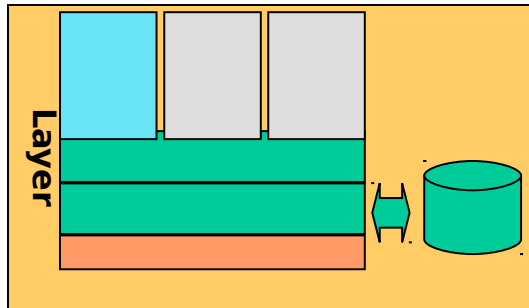




Framework Application Layer



Mission Planning Fly, Fight,



Framework

Application Framework
Control of JMPS Workspace

Document Manager (Explorer)
Point-and-Click access to information

View Selector
Selection and initiation of viewers

Framework Level Viewers

Briefings

Integrated briefing production

Tasks

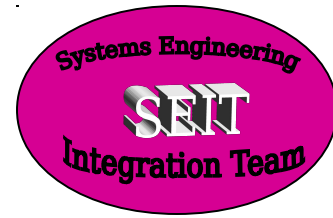
Checklist workflow

JMPS V1

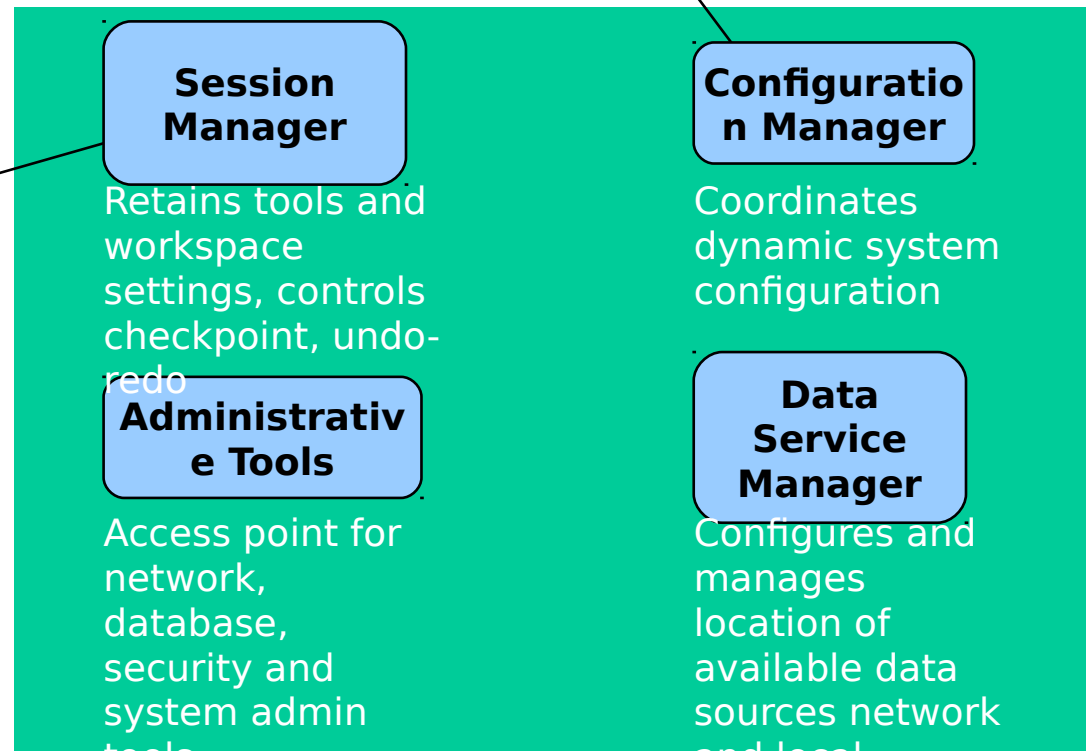
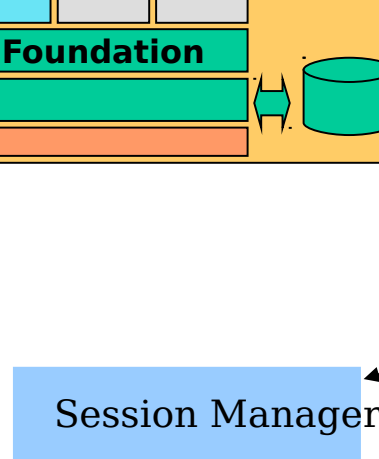
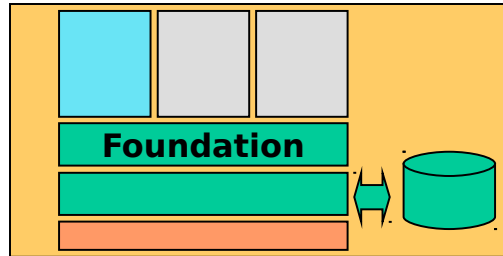
Future



Framework Foundation Layer

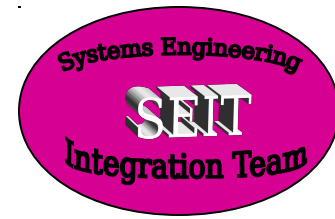


→ *Mission Planning Fly, Fight,*

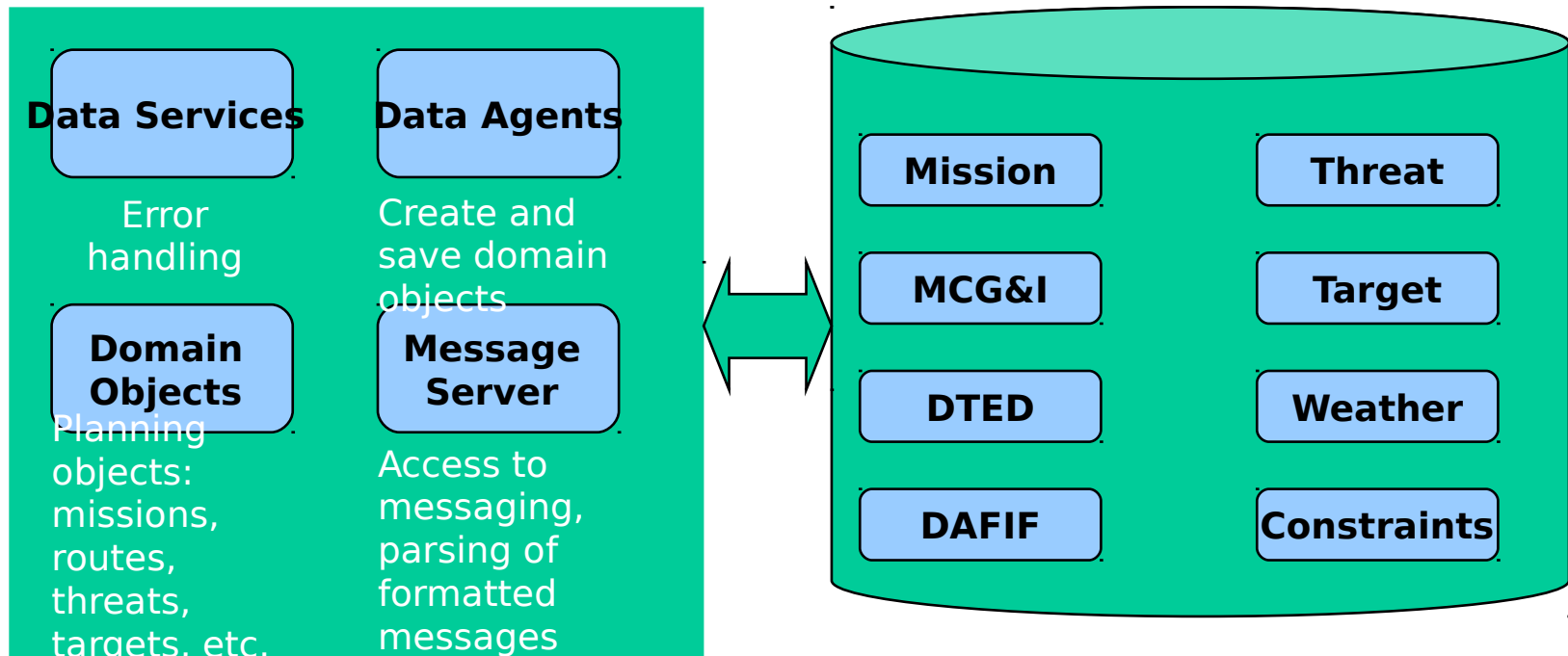
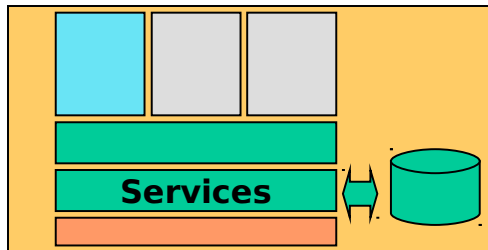




Framework Services Layer

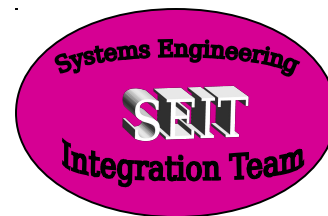


→ *Mission Planning Fly, Fight,*



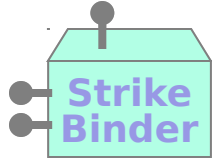
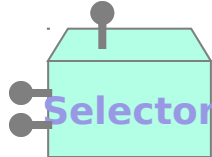
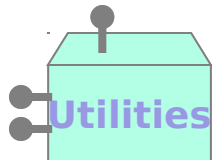
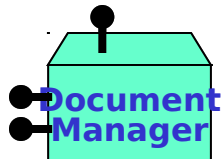
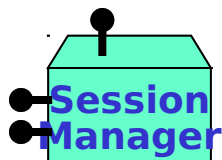


Flexible System Scaling



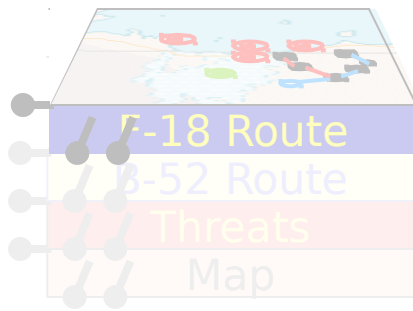
Mission Planning Fly Fight,

Frame

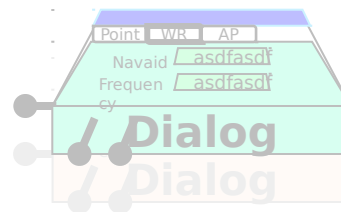


Document Window

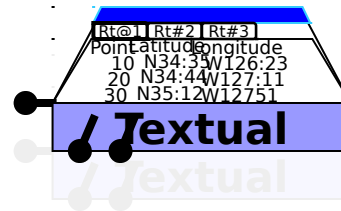
Graphic View



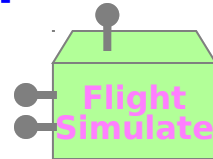
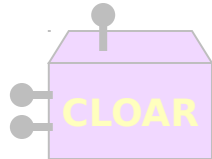
Shared Dialog



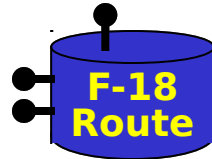
Textual Editor



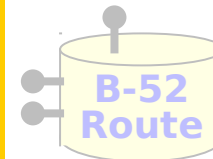
Compute



Local



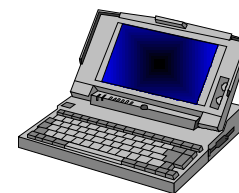
Remote



Complex Planning



Simple Planning

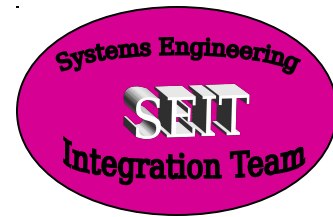


Portable Planning





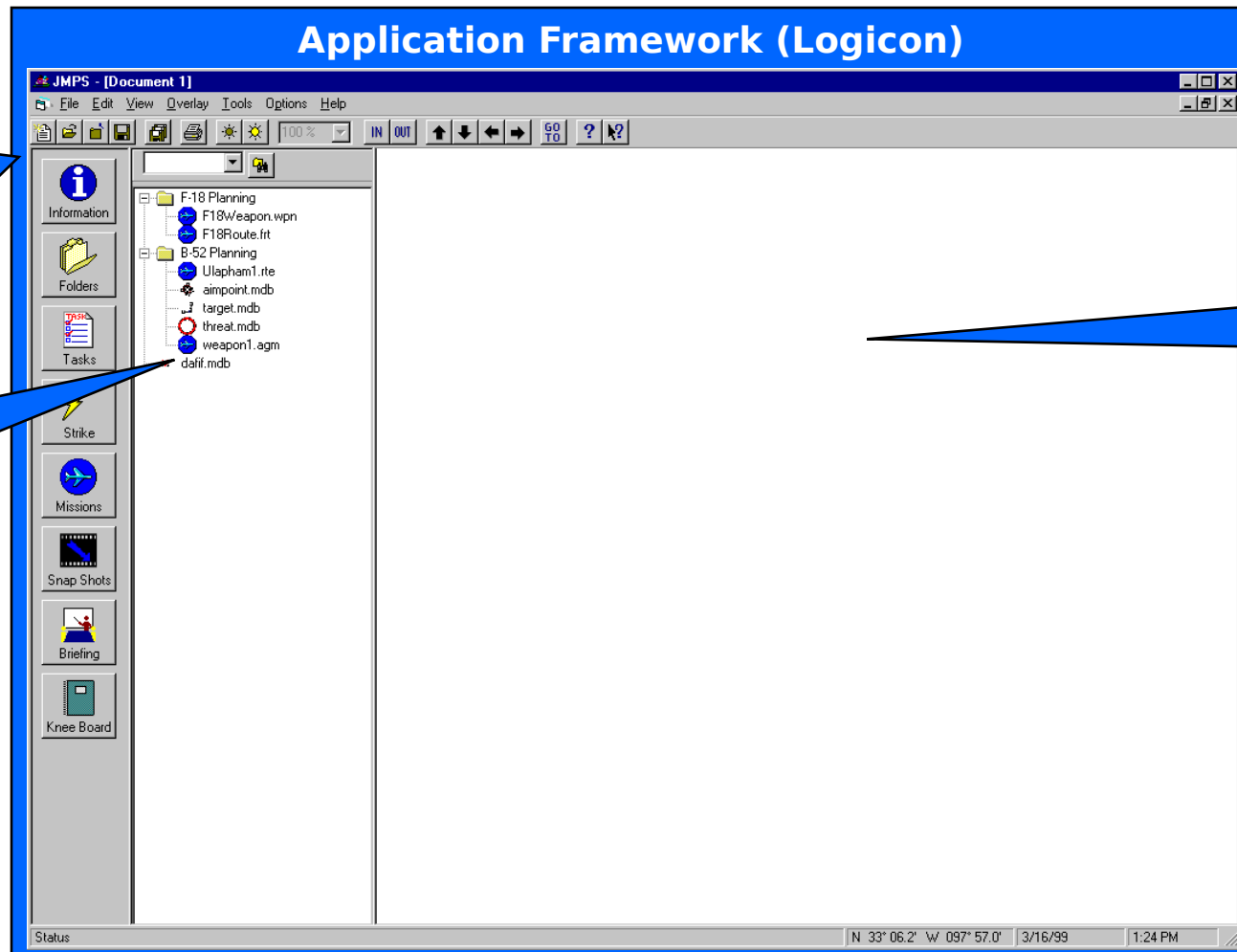
JMPS Application



Mission Planning Fly, Fight,

**View
Selector
(NGIT)**

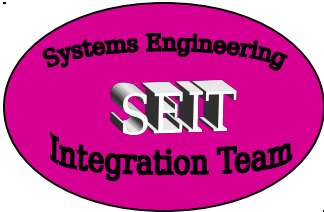
**Document
Explorer
(NGIT)**



**View
Container
(NGIT)**



Route Generation



Mission Planning Fly, Fight, Hover Tool

Tabular Route Editor

Turn Pt	DTD	Type	Fix/Point Description	Latitude	Elev	Aspd	Altitude	Temp	MH	Log Time	Log Dist	Log Fuel
1	ST		KLUFIA	N 33 32.10	1090		1090M	+13C				
2			LUKE AFB	WN12 22.98	12.5E							
2			TUSAR	N 32 05.71	2670	444T	22000M	-29C				
3			TUCSON	WN10 54.09	11.0E	444T	22000M	-29C				
3			GENIR	N 32 57.38	790	444T	22000M	-29C				
4			OLA BEND	WN12 40.46	12.4E	444T	22000M	-29C				
4			KPHX/A	N 33 26.17	1133	444T	22000M	-29C				
5			PHOENIX SKY HA	WN12 00.57	12.4E							
5			KLUFIA	N 33 32.10	1090	444T	22000M	-29C				
			LUKE AFB	WN12 22.98	12.5E							

Refuel Editor

Route Properties Summary

AR Route: AR638 User Type: Tanker Route Point: TUS/R Receiver Type: Other AR Airspeed: 275C

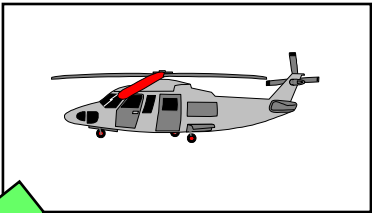
RZ Type: Enroute AR Altitude: 27000 MSL Cruise Flight Mode: STANDARD

Point Parallel: Exit fuel delta: 0 klbs

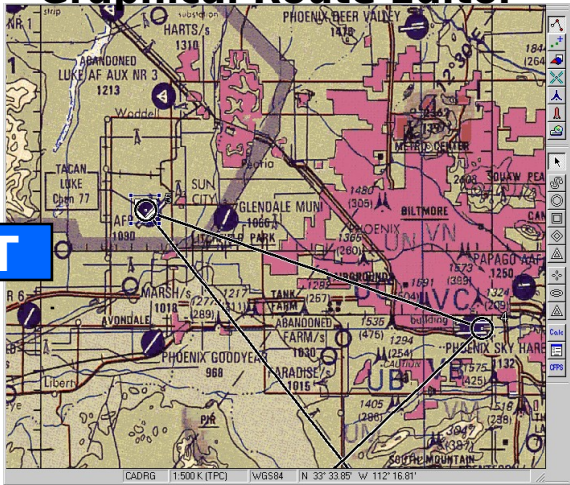
Choose Points: Make IP an OAP Make AP points OAPs

Set ARCT: N/A Exit Time: N/A

Hover Tool



Graphical Route Editor



Dialog Route Editor

PFPS Point editor - sample

General Calc Turn FPM GEO Misc Fuel AddPt

Point Information

Fix: TUS/R Type: TURN

Desc: TUCSON Aspd: 444T

Latitude: N 32 05.71 Bank:

Longitude: W 110 54.89 Alt: 22000M

Elevation: 2670FT Wind:

MagVar: 11.8E Temp: 29C

DTD#:

Center Map

Point #: 2

GFI

NGIT

Calc

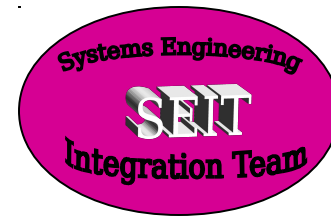
FPM

Route Editor

Route

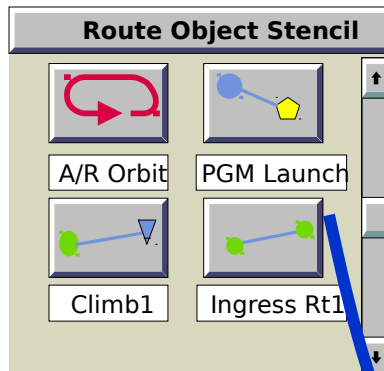


Route Generation

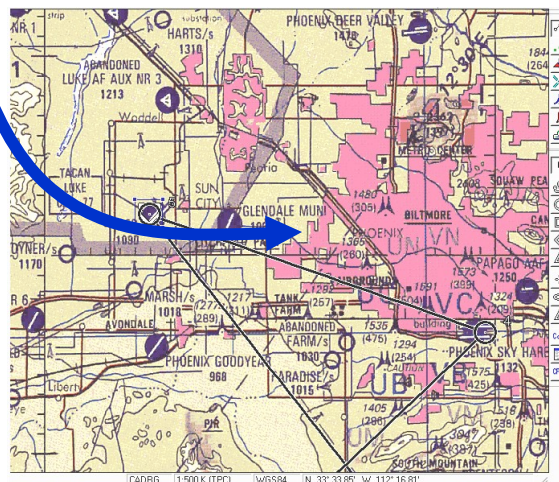
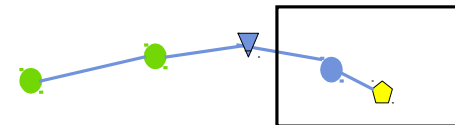


Mission Planning Fly, Fight,

Graphical Route Editor



Easy to Use

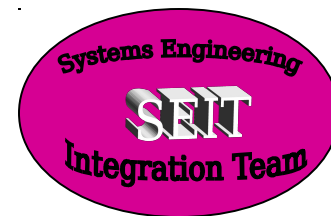


- **Graphical Route Editor Enhanced Capabilities**

- **Stencils**
 - Provides drag-and-drop planning
 - UPC extensible
 - User extensible
- **Route point connections**
 - Support weapon to carrier connections
 - Support multiple aircraft flying a common route segment
- **Routes with multiple segments**
 - Multiple takeoffs
 - Multiple landings
 - Diverts
 - Disconnected segments

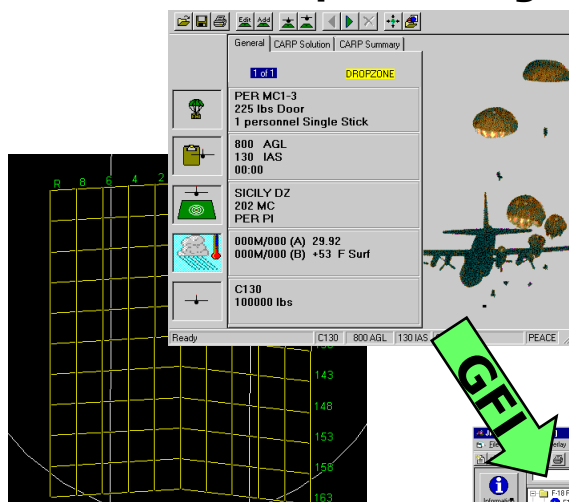


Target/Objective Area Planning

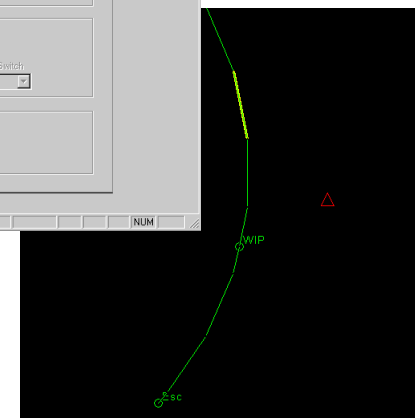
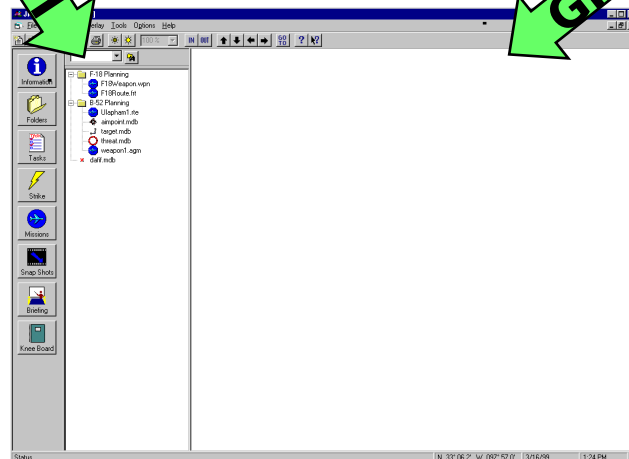
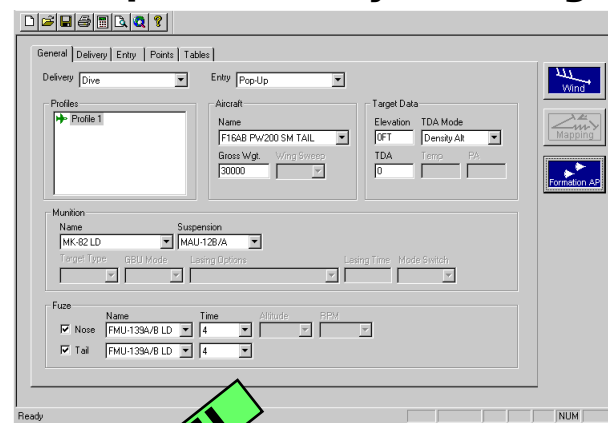


Mission Planning Fly, Fight,

Airdrop Planning

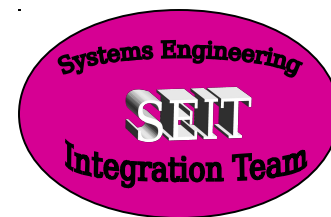


Weapon Delivery Planning





Mission Planning Aids Generation

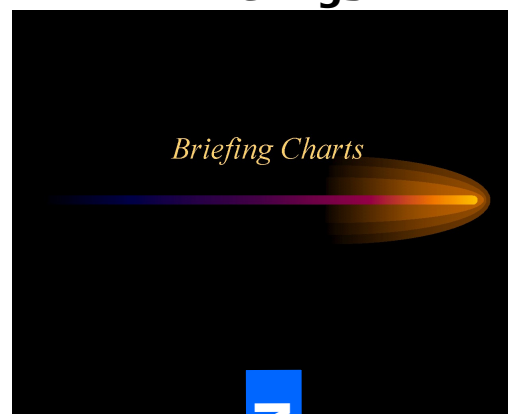


Mission Planning Fly, Fight,

Briefings

Forms Editor

CMF Tool

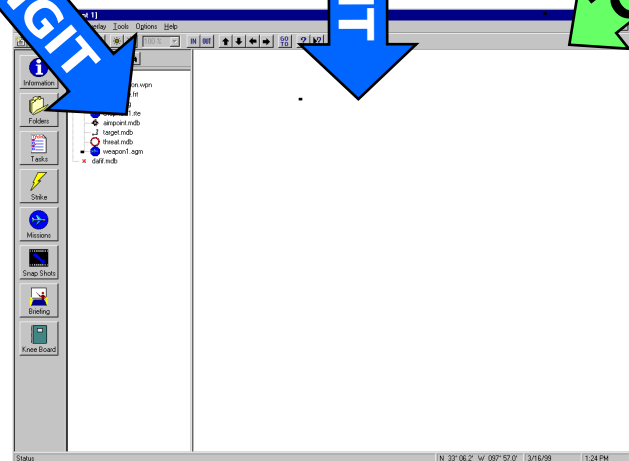


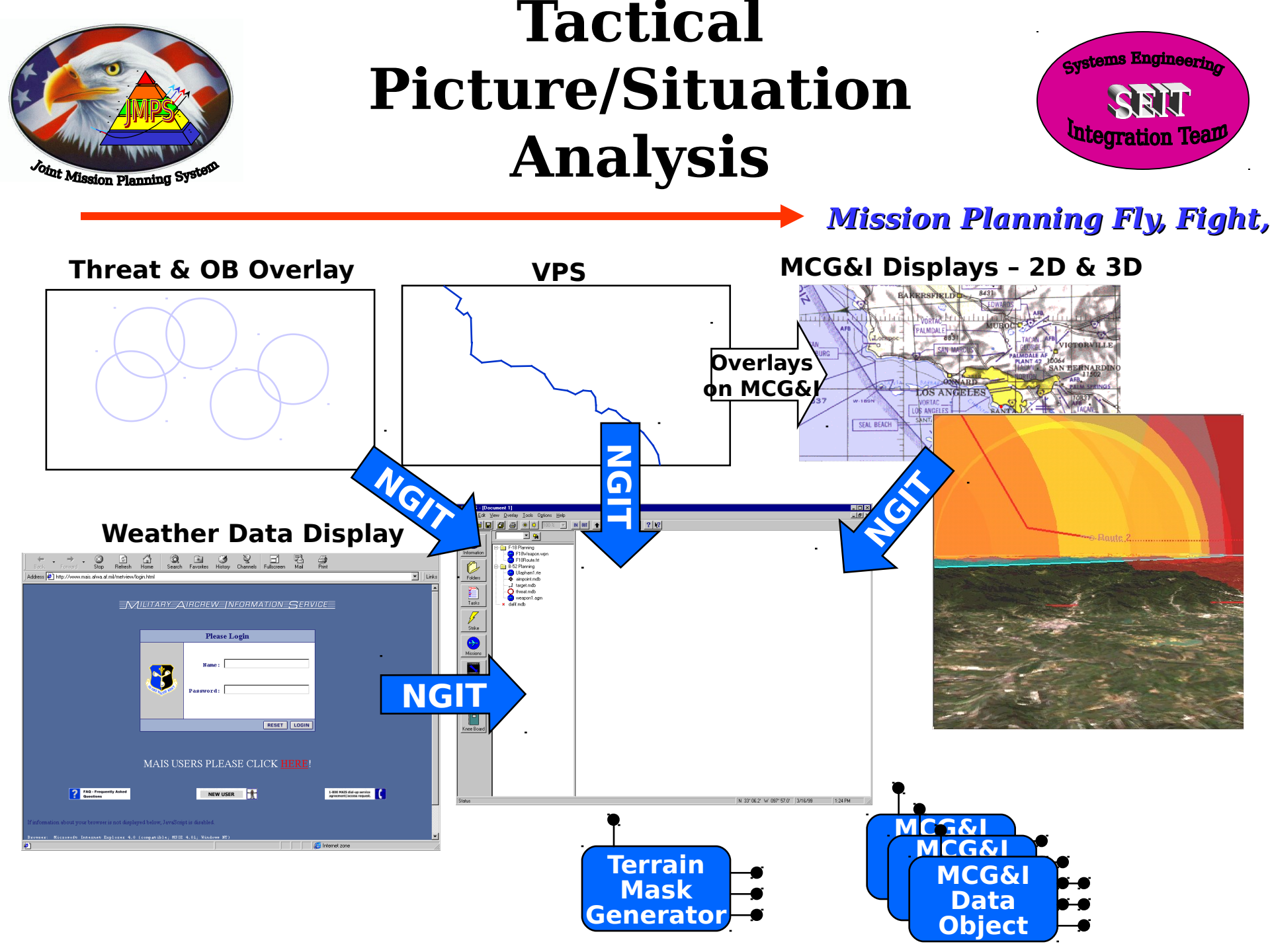
Fontsize=10

TOTAL TIME: 0F0J		TOTAL DIST: 0F0K: 8		FUEL USED: 0F0L		FUEL REM: 8R0B	
TURMPOINT	ALT	MC	DIST	MACH	ETE	TIME	FUEL
TACAN CUT	DC		TAS				LATITUDE
TACAN CHAN	WIND	ENR	VAR	CS	TOTAL		LONGITUDE
HEAD							REM
							ELEVATION
END							
/FOOT							
END							
/LOOP							
0F4D	0F6B	0F6Y	0F4X: 7	0F4T	0F4W	0F6T	0F4Y
0F4A		0F7T		0F4B			0F4C
0F4P	0F5Y	0F6E	0F4M	0F4U	0F5O		0F4E
END							0F5E
							0F4H
END							

Press F1

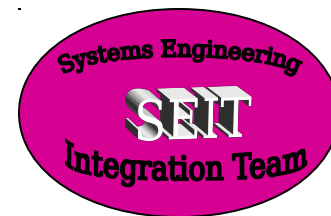
TEXT NUM INS



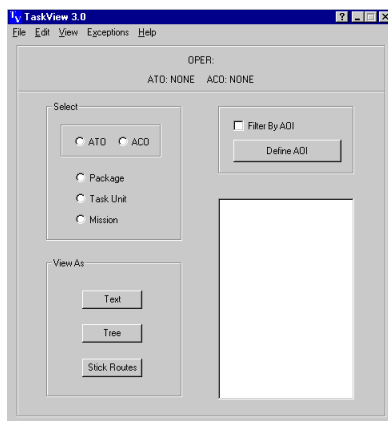




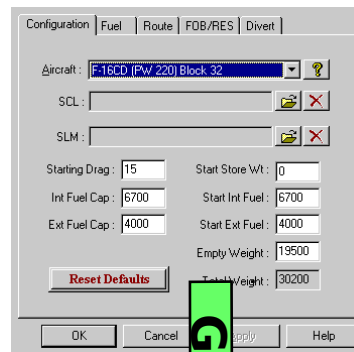
Mission Concept Development/Setup



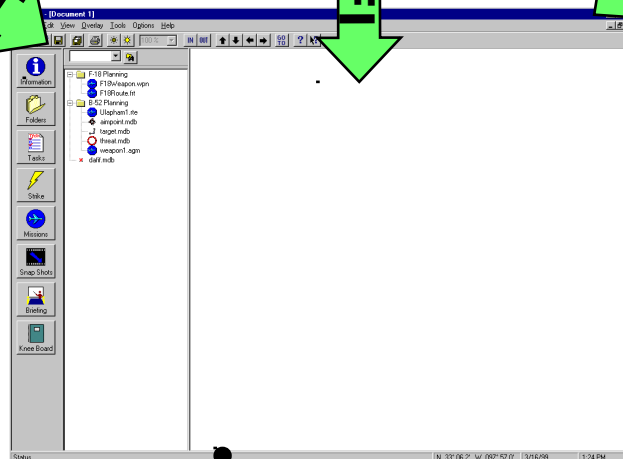
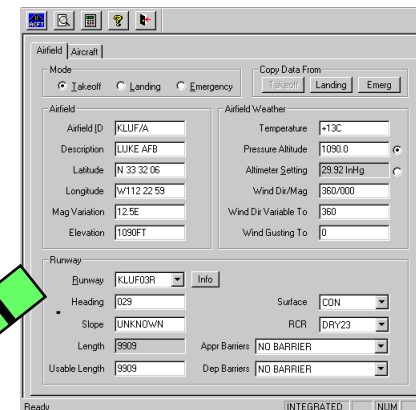
ATO Parser



Platform Definition



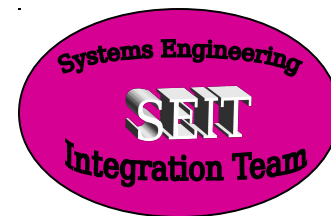
Launch & Recovery



Mission Planning Fly, Fight, Launch & Recovery

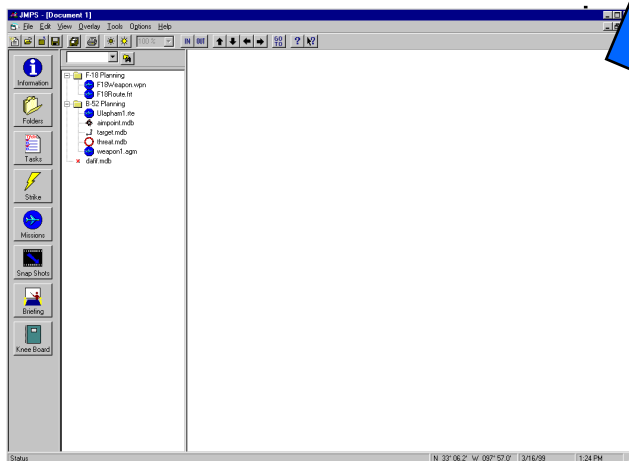


Adaptation



Mission Planning Fly, Fight,

Configuration Manager



NGIT

